

Summary of the Official Action

In the instant Office Action, the Examiner has rejected claims 1 - 33 based upon formal matters and over the art of record. By the present amendment and remarks, Applicant submits that the rejections have been overcome, and respectfully requests reconsideration of the outstanding Office Action and allowance of the present application.

Traversal of Rejection Under 35 U.S.C. § 112, Second Paragraph

Applicant traverses the rejection of claims 1 - 33 under 35 U.S.C. § 112, second paragraph, as being indefinite.

Applicant notes that claims 1 - 33 clearly recite the subject matter that the inventor regards as his invention. In particular, Applicant submits that the recitations in independent claim 1, i.e., measuring water flowing into the wet end section and measuring water flowing out of the wet end section, are clear even without referring to the specification. While the Examiner asserts that it is not clear what is measured, Applicant notes that water flowing into (and out of) the wet end section is measured.

Further, Applicant notes that the specification, *see, e.g.*, paragraph [0062], clearly discloses the measurement of water flowing into and out of the wet end section. Therefore, Applicant submits that one ordinarily skilled in the art reviewing the instant disclosure would be able to readily ascertain the scope of patent protection for the instant invention.

With regard to claim 6, Applicant notes that the term Uhle box is a well known term

of art that those ordinarily skilled in the art would readily understand without further description. Moreover, Applicant notes that the instant application describes the Uhle box as a vacuum device that dewateres the felt by suction. Thus, Applicant submits that the scope of this claims would be readily ascertained by those ordinarily skilled in the art.

With regard to claim 8, Applicant notes that there is no conflict between slurry flow and water flow, since claim 8 merely recites additionally measuring the conductivity of the material suspension in the headbox as the conductivity of the web flowing into the press section.

Accordingly, Applicant submits that claims 1 - 33 clearly recite the subject matter of the instant invention and that the pending claims are fully in compliance with the requirements of the statute. Therefore, Applicant requests that the Examiner reconsider and withdraw the rejection of claims 1 - 33 under 35 U.S.C. § 112, second paragraph, and indicate that these claims are in proper form.

Traversal of Rejection Under 35 U.S.C. § 103(a)

1. Over Lilburn

Applicant traverses the rejection of claims 1 - 6, 18, and 31 under 35 U.S.C. § 103(a) as being unpatentable over International Publication No. WO00/08462 [hereinafter "LILBURN"]. The Examiner asserts that LILBURN discloses measuring water flowing into the wet end section, measuring water flowing out of the wet end section, detecting

conductivity of the wet web entering the wet end section, determining conductivity of the water flowing into the wet end section through water sprayers, determining conductivity of water flowing out of the wet end section in press pans, and determining a material balance from the measured quantities v. Applicant traverses the Examiner's assertions.

Applicant's independent claim 1 is directed to a process for monitoring dewatering in a wet end section of a web production machine, that recites, *inter alia*, measuring water flowing into the wet end section, measuring water flowing out of the wet end section, detecting conductivity of the wet web entering the wet end section, measuring conductivity of the water flowing into wet end section, measuring conductivity of water flowing out of the wet end section, and determining a water balance from the measured quantities, which is indicative of dewatering in the wet end.

As discussed in the *Background of the Invention* section of the instant application, the now applied document of LILBURN was disclosed. In particular, it was noted that LILBURN discloses calculating wet web flow, while the *solids content of the wet web* and its *conductivity in front of the press* are unknown. Thus, Applicant submits that it is apparent that LILBURN fails to teach or suggest detecting conductivity of the wet web entering the wet end section, as recited in at least independent claim 1.

In this regard, while LILBURN discloses positioning conductivity sensors to measure electrical conductivity of the felts before entering the press section and to measure the

electrical conductivity of the web as it emerges from the press section, there is no teaching or suggestion of measuring the conductivity of the web *entering the wet end section*, as recited in at least independent claim 1.

Further, even assuming, *arguendo*, that one were to determine the conductivity of the web entering the wet end section, LILBURN fails to provide any teaching or suggestion as to how or why one ordinarily skilled in the art would utilize such information within the context of the invention of LILBURN. Moreover, Applicant notes that LILBURN certainly fails to suggest of any benefit to determining the conductivity of the web entering the wet end section, as recited in the pending claims.

Accordingly, Applicant submits that LILBURN fails to teach or suggest the combination of features recited in at least independent claim 1, and likewise fails to suggest any obvious modifications to LILBURN that would render the instant invention unpatentable. Therefore, Applicant submits that the instant rejection is improper and should be withdrawn.

Further, Applicant submits that claims 2 - 6, 18, and 31 are allowable at least for the reason that these claims depend from allowable base claims and because these claims recite additional features that further define the present invention. In particular, Applicant submits that no proper modification of LILBURN teaches or suggests, *inter alia*, wherein the water balance is determined from the equation $\text{water flow (Win)} \times \text{conductivity (Cin)} = \text{water flow}$

(Wout) x conductivity (Cout) , as recited in claim 2; the water balance is determined after each press in the wet section, as recited in claim 3; the dewatering is monitored in a press section, as recited in claim 4; the press section includes at least one press, at least one felt, at least one suction box, at least one shower nozzle; and at least one press pan, and the process further comprises collecting water pressed out in the at least one press in the at least one press pan, collecting water from the at least one felt with the at least one suction box, wherein the collected water is water flowing out of the press section, spraying the at least one felt with water from the at least one shower nozzle, wherein the sprayed water is water flowing into the press section, and determining the water balance of the press section, which is indicative of the dewatering in the press section, as recited in claim 5; the water balance in the press section is determined by the equations (1) Calculated shower water in Uhle flow = Uhle flow x [(sheet conductivity - Uhle conductivity)/(sheet conductivity - shower conductivity)], (2) Calculated shower water in pan flow = Uhle flow x [(sheet conductivity - pan conductivity)/(sheet conductivity - shower conductivity)], (3) Sheet water in Uhle flow = Uhle box total - shower flow in Uhle box, (4) Sheet flow in pan flow = pan total - shower flow in pan, (5) Exit sheet flow (gpm) = (inlet sheet gpm + shower gpm) - (press pan + Uhle box) gpm - (shower measured gpm - shower calculated gpm), and (6) Exit sheet dryness = inlet fiber mass/(exit mass of water + fiber), wherein the Uhle flow and conductivity is from the water collected at least one suction box, recited in claim 6; the water balance in the wet

end section is determined by the equations (1) Calculated shower water in Uhle flow = Uhle flow x $[(\text{sheet conductivity} - \text{Uhle conductivity})/(\text{sheet conductivity} - \text{shower conductivity})]$, (2) Calculated shower water in pan flow = Uhle flow x $[(\text{sheet conductivity} - \text{pan conductivity})/(\text{sheet conductivity} - \text{shower conductivity})]$, (3) Sheet water in Uhle flow = Uhle box total - shower flow in Uhle box, (4) Sheet flow in pan flow = pan total - shower flow in pan, (5) Exit sheet flow (gpm) = (inlet sheet gpm + shower gpm) - (press pan + Uhle box) gpm - (shower measured gpm - shower calculated gpm), and (6) Exit sheet dryness = inlet fiber mass/(exit mass of water + fiber), wherein the Uhle flow and conductivity are determined from the water collected at the at least one suction box, as recited in claim 18; and at papermaking pH, conductivity versus dissolved solids is linear, as recited in claim 31.

Accordingly, Applicant requests that the Examiner reconsider and withdraw the rejection of claims 1 - 6, 18, and 31 under 35 U.S.C. § 103(a) and indicate that these claims are allowable.

2. Over Lilburn in view of Bossen

Applicant traverses the rejection of claim 33 under 35 U.S.C. § 103(a) as being unpatentable over LILBURN in view of BOSSEN (U.S. Patent No. 3,655,980). The Examiner asserts that it would have been obvious to use nucleonic measurements, as disclosed by BOSSEN, to determine the water content of the web. Applicant traverses the Examiner's assertions.

Applicant notes that BOSSEN fails to teach or suggest any of the subject matter noted above as deficient in LILBURN. In particular, Applicant notes that BOSSEN fails to teach or suggest detecting the conductivity of the wet web entering the wet end section, as recited in at least independent claim 1, and certainly fails to suggest any manner of utilizing such information in practicing the invention of LILBURN.

Thus, as neither applied documents teaches or suggests at least the above-noted features of the instant invention, Applicant submits that no proper combination of these documents can render unpatentable the combination of features recited in at least independent claim 1. Further, as BOSSEN fails to suggest any motivation or rationale for modifying LILBURN in any manner that would render the instant invention obvious, the asserted rejection is improper and should be withdrawn.

Further, Applicant submits that claim 33 is allowable at least for the reason that it depends from allowable base claims and because it recites additional features that further define the present invention. In particular, Applicant submits that no proper combination of LILBURN and BOSEN teaches or suggest, *inter alia*, water content of the wet web is calculated from a nucleonic measurement of fiber, water, and forming fabric minus the measured forming fabric minus the fiber weight, as recited in claim 33.

Accordingly, Applicant requests that the Examiner reconsider and withdraw the rejection of claim 33 under 35 U.S.C. § 103(a) and indicate that this claim is allowable.

3. Over Lilburn in view of Lewis with or without Justus or Ely

Applicant traverses the rejection of claims 7 - 17, 19 - 30, and 32 under 35 U.S.C. § 103(a) as being unpatentable over LILBURN in view of LEWIS (U.S. Patent No. 5,093,795), with or without JUSTUS (U.S. Patent No. 3,185,617) or ELY, Sr. (U.S. Patent No. 3,268,390) [hereinafter "ELY"]. The Examiner asserts that the use of plural presses is well known from LEWIS or JUSTUS or ELY, and that it would have been obvious to perform the water balance of LILBURN in the press sections of LEWIS, JUSTUS, or ELY. The Examiner further asserts that the conductivity of wet web could be determined from the slurry of LEWIS prior to web formation. Applicant traverses the Examiner's assertions.

Applicant initially notes that, while the Examiner has asserted that the conductivity of the slurry of LEWIS *could be* determined, there is no teaching or suggest that it would have been obvious to modify LILBURN to utilize such a determination, and certainly no suggestion how or why one ordinarily skilled in the art would be motivated to modify the practice of LILBURN in this manner, particularly when there is no teaching or suggestion how measuring conductivity before the press would affect or change the calculation performed by LILBURN.

Thus, notwithstanding that such a measurement *could be* made in LILBURN, the art of record fails to provide any reason as to why one ordinarily skilled in the art would perform such a measurement in conjunction with the LILBURN process. Accordingly, Applicant

submits that the art of record fails to render the instant invention unpatentable.

Further, Applicant submits that claims 7 - 17, 19 - 30, and 32 are allowable at least for the reason that these claims depend from allowable base claims and because these claims recite additional features that further define the present invention. In particular, Applicant submits that no proper combination of LILBURN in view of LEWIS with or without JUSTUS or ELY teaches or suggests, *inter alia*, the press section comprises a plurality of presses, and the water balance is determined after each press, as recited in claim 7; measuring the conductivity of the material suspension in the headbox as the conductivity of the web flowing into the press section, as recited in claim 8; at least one of the collected water from the press pan and the collected water from the suction box is collected sectionally in the cross-direction, as recited in claim 9; the conductivity of the at least one sectionally collected water is sectionally determined, as recited in claim 10; the press section includes a plurality of presses, and the water balance is determined sectionally after each press to create a cross-direction water removal profile, as recited in claim 11; the press section includes at least one control unit to monitor the cross-direction water removal profile and selectively adjust parameters to optimize felt life, as recited in claim 12; measuring the conductivity of the material suspension in the headbox as the conductivity of the web flowing into the press section, as recited in claim 13; the conductivity and water flow of the web entering a subsequent press is calculated from the water balance, as recited in claim 14; the collected

water from the press pan and the collected water from the suction box are collected sectionally in the cross-direction, and the conductivity of the sectionally collected water is sectionally determined, as recited in claim 15; a cross-direction profile of the sheet/shower water ratio in the at least one suction box is calculated to determine the cross-direction sheet water removal into the felt, as recited in claim 16; supplying a suspension from a headbox to form the wet web, wherein the determined conductivity of the wet web entering the wet section corresponds to the conductivity of the suspension in the headbox, as recited in claim 17; the wet end section comprises a plurality of presses, and the water balance is determined after each press, as recited in claim 19; measuring the conductivity of the material suspension in the headbox as the conductivity of the web flowing into the wet end section, as recited in claim 20; at least one of the collected water from the press pan and the collected water from the suction box is collected sectionally in the cross-direction, as recited in claim 21; the conductivity of the at least one sectionally collected water is sectionally determined, as recited in claim 22; the wet end section includes a plurality of presses, and the water balance is determined sectionally after each press to create a cross-direction water removal profile, as recited in claim 23; the wet end section includes at least one control unit to monitor the cross-direction water removal profile and selectively adjust parameters to optimize felt life, as recited in claim 24; the selectively adjustable parameters include vacuum strength, suction box slot size, nip loading in the press, and shower flow, as recited in claim 25; measuring the

conductivity of the material suspension in the headbox as the conductivity of the web flowing into the wet end section, as recited in claim 26; the conductivity and water flow of the web entering a subsequent press is calculated from the water balance, as recited in claim 27; the collected water from the press pan and the collected water from the suction box are collected sectionally in the cross-direction, and the conductivity of the sectionally collected water is sectionally determined, as recited in claim 28; a cross-direction profile of the sheet/shower water ratio in the at least one suction box is calculated to determine the cross-direction sheet water removal into the felt, as recited in claim 29; the equation conductivity x water flow is additive, as recited in claim 30; and supplying a suspension from a headbox to form the wet web, wherein the determined conductivity of the wet web entering the wet section corresponds to the conductivity of the suspension in the headbox, as recited in claim 32.

Accordingly, Applicant requests that the Examiner reconsider and withdraw the rejection of claims 7 - 17, 19 - 30, and 32 under 35 U.S.C. § 103(a) and indicate that these claims are allowable.

Application is Allowable

Thus, Applicants respectfully submit that each and every pending claim of the present invention meets the requirements for patentability under 35 U.S.C. §§ 102 and 103, and respectfully request the Examiner to indicate allowance of each and every pending claim of the present invention.

Authorization to Charge Deposit Account


The undersigned authorizes the charging of any necessary fees, including any extensions of time fees required to place the application in condition for allowance by Examiner's Amendment, to Deposit Account No. 19 - 0089 in order to maintain pendency of this application.

CONCLUSION

In view of the foregoing, it is submitted that none of the references of record, either taken alone or in any proper combination thereof, anticipate or render obvious the Applicants' invention, as recited in each of claims 1 - 33. The claims have been discussed to eliminate any arguable basis for rejection under 35 U.S.C. § 112. In addition, the applied references of record have been discussed and distinguished, while significant claimed features of the present invention have been pointed out.

Accordingly, reconsideration of the outstanding Office Action and allowance of the present application and all the claims therein are respectfully requested and now believed to be appropriate.

Respectfully submitted,
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